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Methane leak may have been the culprit

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While officials have refused to comment on the possible cause of the mine explosion in Chhattisgarh's Koriya district, interviews with miners, rescue workers and doctors on the site of Thursday's blast suggest that it could have been caused by a methane leak in a coal seam more than 200 metres below the surface.

Methane and Carbon monoxide leaks are a danger in any coal-mining operation. Once ore is excavated, it is imperative to block the empty passageways lest they fill up with potentially explosive gases. In the Anjan Hill mines, the passageways were blocked by reinforced concrete panels more than a metre thick.

According to miners, a gas leak was detected in one such reinforced concrete panel as early as Monday. Accordingly, the work was suspended; on Thursday morning, a six-member technical team was tasked with fixing the leak. Rescue teams of 32 mine workers were assembled at the mouth of the mine to assist the technical team, if need be.

"In a mine, as in the human body, the temperature can rise for a number of reasons. It could be carbon monoxide; it could be methane," said a miner.

He said the team went in, expecting to plaster over a carbon monoxide leak — a fairly routine operation — only to be confronted by a massive methane explosion. "You could say we were treating for malaria when it turned out to be typhoid."

The explosion sent a mixture of methane, carbon monoxide and coal dust searing up towards the rescue teams stationed at the mouth of the mine, killing S.K. Goswami, Deputy General Manager, Operations, instantaneously and injuring another 31. Four died subsequently and three others are in a critical condition. The technical team is still unaccounted for.

"The miners died of gaseous suffocation caused by methane and coal dust," said a doctor, who had access to the post-mortem report. "The hot gases entered the respiratory tract of the miners causing severe burns to their lung tissue and trachea."

Doctors also noted the peeling of the skin due to the hot coal dust hurled up by the explosion.

The high concentration of methane in the mine means those trapped in the mine — if still alive — are unlikely to survive for much longer. "Methane is a highly toxic gas," said a doctor at the hospital at Chirimiri. "It deoxygenates the blood by forming methemoglobin and paralyses the brain and destroys the cardiovascular system."

Human respiration is premised on oxygen bonding with haemoglobin in the blood to form oxy-haemoglobin — a stable chemical entity that delivers oxygen to our tissues.

By bonding with haemoglobin to form methemoglobin instead, methane deprives the human body of the much-needed oxygen.

"It's a real tragedy," said the doctor. "Mr. Goswami was a close friend. He was 58. Another two years and he would have retired peacefully."

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